



P/1537-206

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Re Patent Application of:

Thomas M. MILLER, et al.

Date: September 29, 1997

Serial No.: 08/680,502

Group Art Unit: 1308

Filed: July 8, 1996

Examiner: N. McCarthy

For: METHOD FOR THE REDUCTION AND CONTROL OF THE  
RELEASE OF GAS AND ODORS FROM SEWERAGE AND  
WASTE WATER

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GROUP 1300  
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Assistant Commissioner for Patents  
Washington, D.C. 20231

AMENDMENT IN RESPONSE TO OFFICE ACTION

Sir:

In response to the Office Action dated July 2, 1997,  
please reconsider the above-identified application in view of the  
following remarks.

In the Claims

Please amend claim 1 as follows:

1. (Amended) A method for reducing the formation and  
release of an acid gas in sewerage or waste water, comprising the  
step of:

adding an effective amount of an agent that includes  
a compound selected from the group consisting of magnesium  
hydroxide and magnesium oxide to said sewerage or waste water,  
wherein said sewerage or waste water includes at least one  
compound which can be reduced to form acid gas.

REMARKS

Claims 1-27 were pending in this application.  
According to the July 2, 1997 Office Action, claims 1-27 are  
rejected. Applicants have amended claim 1. Thus, claims 1-27  
are now under reconsideration.

Support for the amendment to claim 1 may be found inter  
alia in original claim 1, line 6.

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**Request for Formal Drawings**

In response to the Notice of Draftsperson's Patent Drawing Review attached to the Office Action dated July 2, 1997, Applicants enclose herewith three (3) sheets of formal drawings of Figures 1-3 for the above-identified application.

**Rejections under 35 U.S.C. § 103(a)**

The Examiner rejected claims 1-27 under 35 U.S.C. §103(a) as allegedly unpatentable over Miyanohara et al. (Two patents to Miyanohara et al. are of record, U.S. Patent Nos. 4,118,319 and 4,125,466. Since the Examiner did not specify which one was applied, Applicants will remark on both and refer to them as "Miyanohara '319" and "Miyanohara '466," respectively.) in view of U.S. Patent No. 2,852,584 to Komline ("Komline '584") and Applicants' disclosure at pages 10-11. Applicants respectfully traverse this rejection.

**Cited References Address Different Problem**

Applicants' invention provides a solution to the long-standing and severe problem of gaseous release, particularly to odorous gas release and acid gas release, from sewerage and waste water collection systems, while preserving the beneficial bacteria in the system. Applicants found this can be accomplished by introducing relatively insoluble magnesium oxide and/or magnesium hydroxide into the contaminated water to attain a specific pH.

Neither Miyanohara '319 nor Miyanohara '466 address the problem confronted by Applicants, much less suggest a solution thereto. The cited references disclose technology specific to the wholly different problem of sludge conditioning at a treatment plant. The problem they address is the one of making sludge filterable. This is completely different from the problem addressed by Applicants.

Nor does Komline '584 address the problem confronted by Applicants, much less suggest a solution. Komline '584 relates to lime conditioning. Lime conditioning is well known

and widely practiced in the industry prior to sludge filtration. However, one skilled in the art would have been aware that adding lime as in Komline '584 to a collection system (that is, prior to treatment), will kill all bacteria, increase BOD at the treatment plant, and precipitate nearly everything from solution. For a sewerage or waste water system this is a severe economic disadvantage and is among the reasons the technique is not practiced in collection systems.

The Miyanohara references alone do not make the invention obvious since those references are directed to a completely different problem - that of sludge filtering. The Examiner's secondary reference, Komline '584, is also directed to sludge conditioning. Thus a combination of sludge patents can not teach the solution to the completely different problem of gaseous release in the different field of sewage and waste water collection systems as in Applicants' claimed invention. Clearly the cited references fail to teach application of their alkaline substances to collection systems. While Komline '584 teaches that lime can deodorize sludge, it teaches nothing with respect to sewerage or waste water treatment, which present totally different problems.

The significance of the Examiner's reference to the disclosure at pages 10-11 is unclear. That THIOGUARD® is commercially available is of no consequence to the rejection, and in fact tends to show the non-obviousness of Applicants' invention. Specifically, the commercial availability of THIOGUARD®, but its lack of use for odor and corrosion control in sewerage or waste water systems, tends to rebut a prima facie case of obviousness. The mere presence of THIOGUARD® in the marketplace does not teach Applicants' invention.

**The Art Teaches Away From Applicants' Invention**

Further evidencing lack of obviousness is the absence of any reference to the use of magnesia for collection system odor control in the manuals of practice for this industry. ASCE Manuals and Reports on Engineering Practice - No. 69 titled "Sulfide in Wastewater Collection and Treatment Systems" represents the manual on engineering practice related to sulfides and wastewater. (Library of Congress Catalog Card No. 89-117, ISBN 0-87262-681-4). Copies of relevant pages appear with the Information Disclosure Statement filed herewith.

According to this book, it "is intended to help planners, designers, and operators of wastewater facilities to understand sulfide problems and methods of quantifying and controlling them. It provides a compilation of theoretical and practical information based on current scientific understanding and state-of-the-art engineering practice" (Chapter 1 - Introduction, page 1, section B, first paragraph). "Key sulfide related problems discussed in this manual include: 1) corrosion of facilities; 2) odor nuisance; 3) health hazards; 4) treatment plant upsets" (Chapter 1 - Introduction, page 1, Section, 2nd paragraph)." This book was published eleven years after both Miyanohara references.

On page 1, the text reads "[s]ulfide has been the cause of countless odor complaints, has cost industry and utility companies millions of dollars in corrosion damages, and has caused serious illness or death to many wastewater facility personnel."

On page 3, the text reads "...despite all the information available, there are still large unknown areas, such as unknown reactions, occurrence of unknown intermediates, and uncertainty as to when sulfide will be a problem. The choice of the most positive and cost-effective method for control is sometimes difficult. A great need remains for more research and field studies on sulfide."

Contributors to, "Odor Control in Wastewater Treatment Plants" and "Sulfide in Wastewater Collection and Treatment

Plants" clearly skilled artisans, are well aware of sludge conditioning as taught by Komline '584, Miyanohara '319 and Miyanohara '466. Notwithstanding the awareness of the clear and compelling need pointed out by these experts, neither the industry manuals of practice, nor their research ever considered continuous addition of magnesia. This is because the benefits of magnesia are not obvious from the prior art. Not even to the best of those skilled in that art.

### Conclusion

None of the cited references disclose the use of magnesia for collection system odor control. Lime and caustic soda are frequently cited together with a host of others too numerous to mention. Lime and caustic soda have been utilized for odor control in collection systems but are unacceptable because they do not provide sufficient pH stability. Importantly, this pH instability is not taught by any of the cited references. For this reason caustic is used for sludge dosing to kill odor producing bacteria. However, the mechanism for biocide odor control is completely different from the mechanism for gas control taught by the Applicants.

Applicants have found magnesium oxide/hydroxide to be uniquely suited for gas control because it, unlike lime and other alkaline sources, is very high in alkalinity but only slightly soluble in water. Therefore, conditions can be maintained over time during which presence of any hydrogen sulfide, for example, and the associated odor are reduced, and beneficial bacteria are not destroyed. See, e.g. page 6, line 25 to page 8, line 18 of Applicants' disclosure.

In summary, neither Miyanohara '319, Miyanohara '466, nor Komline '584 address the problem confronted by Applicants, much less suggest a solution thereto.

Accordingly, the rejection under 35 U.S.C. § 103 based on Miyanohara '319, Miyanohara '466 and Komline '584 should be withdrawn and the subject application should be allowed to

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proceed to issuance. The early allowance of this application is respectfully solicited.

**Information Disclosure Statement**

Applicants submit herewith a copy of the aforementioned ASCE reference together with a form listing the same for consideration by the Examiner. Applicants request the Examiner to make this reference of record in the subject application.

If there are any issues or amendments the Examiner wishes to discuss, the Examiner is encouraged to call the undersigned.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on September 29, 1997:

Respectfully submitted,

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Douglas A. Miro  
Name of applicant, assignee or  
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\_\_\_\_\_  
Signature  
  
\_\_\_\_\_  
September 29, 1997  
Date of Signature

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